Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

later in ontogeny, until what was first in phylogeny comes to be last in ontogeny. This disposition of the recapitulation theory appears in various places throughout the volume, and it is evident that the author regards it as reliable only within certain limits, when it agrees with other evidence.

From among the general conclusions the following may be selected as of most general interest. The author concludes that no definite algal form now living can be held to have been a direct progenitor of any known archegoniate type; but that certain algae suggest in their post-sexual phase how the initiation of the sporophyte may have occurred. Also the liverworts and mosses may be held to be "blind branches of descent;" but they illustrate changes that suggest the origin of sterile tissues from those potentially fertile, and the final establishment of a self-nourishing system in the sporophyte.

The gametophyte of early pteridophytes was probably a relatively massive green structure, with deeply sunk sexual organs; and the sporophyte was the strobiloid type of body illustrated by *Lycopodium Selago* and its allies (the author's well-known "theory of the strobilus"). This reconstruction of the most primitive vascular body is obtained by converging all the known pteridophyte lines, and the result is a body which arose from no one knows what, but which does not suggest any known bryophyte or alga.

This is a very meager outline of the contents of a large volume, crowded with facts and suggestions. Such speculation brings perspective and stimulus, and its only danger is a confusion of theory with fact, for which the author in this case could not be held responsible. Perhaps the most serious charge that could be brought against him, in this connection, is his great command of picturesque statements, which are highly figurative but contain perilous suggestions for the unwary. For example, that "encouragement was given" to a multiplication of spores; that the method of fertilization in archegoniates is "awkward and embarrassing;" that "a premium was put upon" aerial spores, etc., are extremely telling forms of statement, but they are more rhetorical than exact, suggesting far more than was intended.

At all events, the volume is a monument to the research power and philosophical insight of its distinguished author.—J. M. C.

Electro-physiology

Two years ago plant physiologists were rather taken aback by a large volume of researches on plant response from the pen of a contributor previously unknown in this field. It is not often that so brilliant a display marks the advent of a new scientific luminary, and it was impossible at once to determine whether he was a meteor, whose light would flash and disappear, or a star of the first magnitude. There were not wanting, indeed, signs that he was erratic. This work[2] conspicuously lacked relation to the present state of knowledge and showed scant acquaintance with the researches of others; while the naïveté with which some of the most recondite problems were attacked and dismissed as solved awakened amused incredulity. At the same time the author's ingenuity in devising and adapting self-registering methods to the mechanical and electrical responses of plants, as well as the suggestiveness of some of his results, made the book possibly an epochal one, since it struck out a rather new path for most important investigations.

---

[2] BOSE, J. C., Plant response as a means of physiological investigation. See review in BOTANICAL GAZETTE 42:148. 1906.

So far, however, nothing has come of it. Its reception has been apathetic, not to say cold, and to all appearances it has fallen dead because of its faults and in spite of its manifest virtues. No researches have followed it up; no investigator has used its methods. That volume on *Plant response* was the second of a series of three (the first on *Response in the living and non-living*), of which the third has just made its appearance under the title *Comparative electro-physiology.*[3]

The author herein shows the same peculiarities as in the preceding volume. There is the same naïve interest in well-known phenomena, as though they were quite novel; there is the same lack of effort to connect his work with that of others, so far, at least, as citing their researches or results is concerned. It is doubtful if in this book of over 800 pages, dealing with a very special topic on which there must be a legion of workers, there are a dozen citations of original sources. There is much repetition of the earlier volume; the same tilting at windmills—vigorous attacks on vitalism and on the contrast between animals and plants, and between "sensitive plants" and others, till one is tempted to inquire with Sairey Gamp, "Who denyges of it, Betsey, who denyges of it?"

This volume maintains the same simple thesis as its predecessor—as simple as the faith of Islam, "Allah is great and Muhamed is his prophet"—contraction is universal and negativity is its sign. The direct response to every stimulus is "contraction," the indirect one (at a little distance) is "expansion." The former is said to be *accompanied by* reduction and the latter by increase of turgidity, with corresponding electric variations. The expression of contraction in movement, "suction" (ascent of sap), growth, "torsion" (in climbing plants), death, and electric variation, constitutes the theme of the two volumes. This much needs to be said: There are reasons for expecting some universal fundamental reaction in all responses; it may be that BOSE has hit upon it in what he miscalls "contraction" (for this is really nothing but a reduction in turgidity); but his work is not convincing.

This book shares with its predecessor, also, the confusion between energy and stimulus, a confusion that is possible because we know so little of plant energetics. This reaches its absurd climax in the conception of the author as to the function of plant nerve. He gravely tells us that the ramification of the "nerves" in a leaf provides a "virtual catchment basin for the reception of stimulus," whence it is transmitted to the body of the plant, there to be stored and used later in responses. All this is quite apart from the question of the energy fixed in photosynthesis.

---

[3] BOSE, J. C., Comparative electro-physiology, a physico-physiological study. 8vo. pp. xliv+760. *figs. 406.* New York: Longmans, Green & Co. 1908. $5.75.

This suggests another fault. BOSE seems to ignore, if he is not ignorant of, the anatomy of the parts with which he is dealing. Skin is skin, whether it be the skin of plant or animal. Stomach of Gecko and pitcher of Nepenthes (an open stomach of a primitive type, he calls it) are all one to him; they behave alike, in spite of their extraordinary differences of structure. Nerves of animal and nerves of plants, which have been identified by their behavior as the vascular bundles of plants, are physiologically the same. Digestion being a "diphasic process," that is, consisting of secretion first and absorption afterward, roots, which secrete substances that dissolve their mineral "food" and then absorb it, must be another kind of open stomach; and besides, they behave electrically as stomachs do! Now if these things are so, it argues that the responses with which BOSE is dealing are either extremely superficial or extremely fundamental, inhering in all living matter; and in either case they would be of little significance.

The situation seems to be most peculiar. BOSE, we judge, is a brilliant experimentalist, trained first as a physicist, but inadequately equipped with knowledge of what has been done in the field of plant irritability. This has been at once an advantage and a snare. It has left him free to present his researches untrammeled by the conventional view, but it has exposed him to mistakes which a little more knowledge would have avoided. It has given him courage to attack the most knotty problems, but it has led him to satisfaction with inadequate conclusions. Apparently, too, he has become possessed by a theory as to the nature of response, and under the yoke of that theory he makes all his captive facts to pass.

Out of these books we look for some one to rescue many good observations, now apparently gone awry; and by his methods and apparatus in the hands of real physiologists we hope soon to see made important advances in the knowledge of *Reizphysiologie.*—C. R. B.

Conference on Genetics

The report[4] of the Third International Conference on Genetics held under the auspices of the Royal Horticultural Society, July 30 to August 3, 1906, is a veritable treasure-trove for students of heredity, hybridization, and plant-breeding, both in their theoretical and practical aspects. Besides giving a minute account of the doings of the Conference, there is a brief but excellent sketch by the secretary, Rev. W. WILKS, of the life and work of GREGOR MENDEL, illustrated by three good portraits, a fine view of the Abbey at Brünn, and a facsimile letter written to NÄGELI. Excellent portraits are also given of some of the more

---

[4] Report of the Third International Conference, 1906, on Genetics; hybridization (the cross-breeding of genera or species), the cross-breeding of varieties, and general plant-breeding. Edited by the Rev. W. WILKS. 8vo. pp. 496. *figs. 131.* London. 1907.